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AKZO NOBEL INC. LEGAL & IP 120 WHITE PLAINS ROAD, SUITE 300 TARRYTOWN, NY 10591			EXAMINER WILKINS III, HARRY D	
			ART UNIT 1795	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/608,152	Applicant(s) BO ET AL.	
	Examiner Harry D. Wilkins, III	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-12 and 23-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-12 and 23-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 1-3, 5, 6, 9-11, 23, 24 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Millet (US 5,104,499) in view of Oda et al (US 4,299,682).

Millet teaches (see abstract and col. 2, lines 28-45) a process for electrolytic production of alkali metal chlorate in an electrolytic cell divided by a cation selective separator into an anode compartment in which an anode is arranged and a cathode compartment. The process included the steps of introducing an anolyte solution containing alkali metal chloride into the anode compartment, electrolyzing the solution to produce alkali metal chlorate and producing alkali metal hydroxide in the cathode compartment. After being electrolyzed the solution was transferred to a reactor to produce a concentrated alkali metal chlorate electrolyte prior to ultimate crystallization of the alkali metal chlorate in the reactor.

Regarding the amendments to claim 1, the anolyte of Millet had a pH of 6.2 to 6.6. The evaporation of water from the product of Millet would have produced the claimed concentration of chlorate prior to ultimate crystallization.

With respect to the reactor being a chlorate reactor, the claims do not further limit the structure of the reactor and the reactor (crystallizer) of Millet was capable of produced a concentrated alkali metal chlorate electrolyte by evaporation of water from

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the electrolyte. Thus, the disclosure of Millet is deemed to meet the transferring step as claimed.

Thus, Millet fails to teach using a gas diffusion cathode in the cathode compartment and the step of feeding oxygen-containing gas into the cathode compartment.

Of importance is that the reaction at the cathode of Millet produces hydrogen gas and hydroxide ions from the water.

Oda et al teach (see abstract, figure 2, col. 1 and col. 4, line 30-col. 6, line 5) that in divided electrolytic cells for the electrolytic production of Cl_2 and NaOH , the operating voltage of the cell can be reduced by using a gas diffusion cathode, and feeding oxygen to the cathode through a gas chamber (9). The reaction at the cathode involves reaction of the oxygen gas with the water to form hydroxide ions without producing hydrogen gas.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the gas diffusion cathode as taught by Oda et al in the divided electrolysis cell taught by Millet because of the decreased operating voltage which leads to an increased current efficiency.

It is noted that the overall cathode reaction provided by the process cell of Oda et al is similar to the cathode reaction provided by the process of Millet. Both cathodes react an incoming NaOH catholyte to produce additional NaOH at the cathode. Therefore, one of ordinary skill in the art would have had a reasonable expectation of successfully substituting the gas diffusion electrode of Oda et al into the cell of Millet,

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especially in view of the teachings of Oda et al that the gas diffusion electrode was designed to replace hydrogen evolving cathodes.

Regarding claim 2, Oda et al teach (as above, figure 2) that the gas diffusion electrode divided the cathode compartment into a gas chamber (9) on one side of the gas diffusion electrode and an alkali metal hydroxide chamber (7) on the other side thereof. An alkali metal solution was introduced to the alkali metal hydroxide chamber at 12 and an oxygen containing gas was introduced to the gas chamber at 14.

Regarding claim 3, Oda et al teach (as above) using a cation selective membrane.

Regarding claim 5, the anolyte of Millet contained about 100-200 g/L of chloride.

Regarding claim 6, the anolyte of Millet contained about 400-600 g/L of an alkali metal chlorate.

Regarding claim 9, Millet teaches the desire to perform the electrolysis without any chromates present.

Regarding claims 10 and 24, Millet teaches (see example 1) using a catholyte of 20 wt% NaOH (~250 g/L). It would have been obvious to one of ordinary skill in the art to have optimized the amount of NaOH fed to the cathode compartment in order to balance the necessary cost of the NaOH against any increases in productivity produced by adding more NaOH.

Regarding claim 11, Millet teaches (see example 1) operation of the cell at 63°C.

Regarding claim 23, the cell of Oda et al included (see figure 2) a gas diffusion electrode (8) which divided the cathode compartment into a gas chamber (9) on one

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side of the gas diffusion electrode and an alkali metal hydroxide chamber (7) on the other side between the gas diffusion electrode and the cation selective separator. The process of Oda et al included (see Example 1) introducing a weak alkali metal hydroxide solution into the alkali metal hydroxide chamber and oxygen containing gas into the gas chamber. The cation selective separator was a membrane. Millet teaches (see abstract and col. 2) using a pH of the solution of 6.2-6.6.

Regarding claim 26, see above regarding claims 1, 5, 6 and 10.

3. Claims 1, 3-6, 9-11 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Millet (US 5104,499) in view of Shimamune et al (US 6,117,286).

Millet teaches (see abstract and col. 2, lines 28-45) a process for electrolytic production of alkali metal chlorate in an electrolytic cell divided by a cation selective separator into an anode compartment in which an anode is arranged and a cathode compartment. The process included the steps of introducing an anolyte solution containing alkali metal chloride into the anode compartment, electrolyzing the solution to produce alkali metal chlorate and producing alkali metal hydroxide in the cathode compartment. After being electrolyzed the solution was transferred to a reactor to produce a concentrated alkali metal chlorate electrolyte prior to ultimate crystallization of the alkali metal chlorate in the reactor.

Regarding the amendments to claim 1, the anolyte of Millet had a pH of 6.2 to 6.6. The evaporation of water from the product of Millet would have produced the claimed concentration of chlorate prior to ultimate crystallization.

Thus, Millet fails to teach using a gas diffusion cathode in the cathode compartment and the step of feeding oxygen-containing gas into the cathode compartment.

Of importance is that the reaction at the cathode of Millet produces hydrogen gas and hydroxide ions from the water.

Shimamune teaches (see abstract and cols. 1-3, and particularly col. 2, lines 41-56) that the gas diffusion cathodes are meant to replace hydrogen evolving cathodes (where the cathodic reaction was $2\text{H}_2\text{O} + 2\text{e}^- \rightarrow 4\text{OH}^- + \text{H}_2$ (-0.83V)) with electrodes that reacted water with oxygen gas (where the cathodic reaction was $2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^- \rightarrow 4\text{OH}^-$ (0.40V)). This means that theoretically the gas diffusion cathode would reduce cell voltage by as much as 1.23 V, with practical reductions of about 0.8 V, resulting in power savings of 700 kWh per ton of sodium hydroxide produced. Thus, one of ordinary skill in the art would have been motivated by the 700 kWh power savings to replace the hydrogen evolving cathode of Millet with the oxygen consuming gas diffusion electrode of either Oda or Shimamune.

Further, the cell in which the gas diffusion cathode is placed adjacent to the separator/membrane, i.e.-zero-gap, solves many problems associated with either the hydrogen evolving cathode or the three-chamber gas diffusion electrode cells.

Therefore, it would have been obvious to one of ordinary skill in the art to have substituted the gas diffusion cathode of Shimamune et al for the hydrogen evolving cathode of Millet because Shimamune et al teach that doing so can provide significant cost savings in terms of electricity consumed.

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Regarding claim 3, both Millet and Shimamune et al teach using a cation selective membrane.

Regarding claim 5, the anolyte of Millet contained about 100-200 g/L of chloride.

Regarding claim 6, the anolyte of Millet contained about 400-600 g/L of an alkali metal chlorate.

Regarding claim 9, Millet teaches the desire to perform the electrolysis without any chromates present.

Regarding claims 10 and 24, Millet teaches (see example 1) using a catholyte of 20 wt% NaOH (~250 g/L). It would have been obvious to one of ordinary skill in the art to have optimized the amount of NaOH fed to the cathode compartment in order to balance the necessary cost of the NaOH against any increases in productivity produced by adding more NaOH.

Regarding claim 11, Millet teaches (see example 1) operation of the cell at 63°C.

Regarding claim 25, Shimamune et al teach (see cols. 2-3) that arranging the gas diffusion cathode adjacent to the membrane permitted several problems with three-chamber gas diffusion electrode cells to be overcome.

Regarding claim 26, see above regarding claims 1, 5, 6 and 10.

4. Claims 1-3, 5, 7, 9-11 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cook, Jr. (US 3,897,320) in view of Oda et al (US 4,299,682).

Cook, Jr. teaches (see abstract, figure and col. 1, line 52 to col. 2, line 39) a process of making alkali metal chlorate including the steps of introducing an electrolyte solution containing alkali metal chloride into the anode compartment (27) of a divided

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electrolytic cell (11), electrolyzing the electrolyte solution to produce alkali metal chlorate in an electrolyzed solution in the anode compartment, forming alkali metal hydroxide in the cathode compartment (29), and transferring the electrolyzed solution from the anode compartment to a chlorate reactor (35) to react the electrolyzed solution further to produce a concentrated alkali metal chlorate electrolyte. Cook, Jr. teaches (see abstract and col. 3) using a pH of the solution of 2-6. It would have been obvious to one of ordinary skill in the art to have continued the reaction in the chlorate reactor (35) until a desired final chlorate concentration was achieved.

Thus, Cook, Jr. do not teach using a gas diffusion cathode in the divided electrolytic cell and feeding oxygen gas to the gas diffusion cathode.

Oda et al teach (see abstract, figure 2, col. 1 and col. 4, line 30-col. 6, line 5) that in divided electrolytic cells for the electrolytic production of Cl_2 and NaOH , the operating voltage of the cell can be reduced by using a gas diffusion cathode, and feeding oxygen to the cathode through a gas chamber (9).

Therefore, it would have been obvious to one of ordinary skill in the art to have used the gas diffusion cathode as taught by Oda et al in the divided electrolysis cell taught by Cook, Jr. because of decreased operating voltage which leads to an increased current efficiency.

It is noted that the individual electrode reactions provided by the process cell of Oda et al are identical to the reactions provided by the process of Cook, Jr. Both cells react an incoming NaCl anolyte and NaOH catholyte to produce Cl_2 gas at the anode and additional NaOH at the cathode. The Cl_2 of Cook, Jr. immediately dissolves into

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the solvent (water) to form HClO and HCl, whereas the Cl₂ of Oda was permitted to escape the cell in the gaseous state. Therefore, one of ordinary skill in the art would have had a reasonable expectation of successfully substituting the gas diffusion electrode of Oda et al into the cell of Cook, Jr.

Regarding claim 2, Oda et al teach (as above, figure 2) that the gas diffusion electrode divided the cathode compartment into a gas chamber (9) on one side of the gas diffusion electrode and an alkali metal hydroxide chamber (7) on the other side thereof. An alkali metal solution was introduced to the alkali metal hydroxide chamber at 12 and an oxygen containing gas was introduced to the gas chamber at 14.

Regarding claim 3, Oda et al teach (as above) using a cation selective membrane.

Regarding claim 5, Cook, Jr. teaches (see col. 3) a chloride concentration of 200-320 g/l.

Regarding claim 7, Cook, Jr. teaches (see col. 3) that the recycled electrolyte from the crystallizer (61) is not free of chlorate ions and that the chlorate was present at an amount smaller than the chloride in the recycled electrolyte which was 50-100 g/L. Thus, the recycled electrolyte, ultimately fed into the divided electrolytic cell after saturation with sodium chloride would have contained the claimed amount of chlorate ions.

Regarding claim 9, Cook, Jr. does not teach adding any chromate to the electrolyte.

Regarding claim 10, Cook, Jr teaches (see col. 7, lines 45-48) producing a sodium hydroxide concentration of 250-450 g/L.

Regarding claim 11, Cook, Jr. teaches (see col. 7, lines 17-28) controlling the temperature of the electrolyte to be less than 105°C, most preferably in the range of 65 to 85°C.

Regarding claim 23, the cell of Oda et al included (see figure 2) a gas diffusion electrode (8) which divided the cathode compartment into a gas chamber (9) on one side of the gas diffusion electrode and an alkali metal hydroxide chamber (7) on the other side between the gas diffusion electrode and the cation selective separator. The process of Oda et al included (see Example 1) introducing a weak alkali metal hydroxide solution into the alkali metal hydroxide chamber and oxygen containing gas into the gas chamber. The cation selective separator was a membrane. Cook, Jr teaches (see abstract and col. 3) using a pH of the solution of 2-6.

5. Claims 1-6, 8, 10-12, 23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wanngard (US 5,419,818) with evidence from Cook, Jr. (US 3,897,320) in view of Oda et al (US 4,299,682).

Wanngard teaches (see col. 1, lines 18-37, cols. 3-6) a process for producing alkali metal chlorate in a divided electrolytic cell (12) including electrolyzing the anolyte electrolyte solution and transferring the electrolyzed solution to a chlorate reactor (4 or 5). The cell (12) of Wanngard was preferably divided by a cationic selective membrane.

Wanngard teach that the electrolytic cell (12) is a divided electrolytic cell. In this process, the anolyte fed to the cell included NaCl and the catholyte included NaOH.

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The anolyte was electrolyzed to generate Cl_2 gas at the anode and the catholyte was electrolyzed to generate NaOH at the cathode. The Cl_2 was immediately hydrolyzed into HClO and HCl (Wanngard at col. 3, lines 59-68). The HClO is then reacted in the chlorate reactor to form sodium chlorate (NaClO_3). It would have been obvious to one of ordinary skill in the art have operated the reaction in the chlorate reactor until a desired final chlorate concentration was achieved.

Wanngard teaches (see col. 6) using a pH of the solution of 5.5-6.5.

Wanngard fails to teach the production of any chlorate within the divided electrolytic cell. However, it was known to one of ordinary skill in the art that any hydroxide ions crossing the membrane in a divided electrolytic cell would react with the hypochlorite ions (ClO^-) to cause formation of chlorate ions (ClO_3^-). Evidence of this knowledge can be seen in Cook, Jr. at col. 2, lines 5-26, which states that cation-active permselective membranes allow some hydroxyl ions to migrate through from catholyte to anolyte. The hydroxyl ions then react in the anolyte to produce chlorate. Thus, in the process of Wanngard, at least some chlorate ions were produced in the anode compartment of the divided electrolytic cell.

Thus, Wanngard fails to teach the claimed cell which had a gas diffusion cathode and feeding oxygen to the gas diffusion cathode.

Oda et al teach (see abstract, figure 2, col. 1 and col. 4, line 30-col. 6, line 5) that in divided electrolytic cells for the electrolytic production of Cl_2 and NaOH, the operating voltage of the cell can be reduced by using a gas diffusion cathode, and feeding oxygen to the cathode through a gas chamber 9.

Therefore, it would have been obvious to one of ordinary skill in the art to have used the gas diffusion cathode as taught by Oda et al in the divided electrolysis cell taught by Wanngard because of decreased operating voltage which lead to an increased current efficiency.

It is noted that the individual electrode reactions provided by the process cell of Oda et al are identical to the reactions provided by the process of Wanngard. Both cells react an incoming NaCl anolyte and NaOH catholyte to produce Cl_2 gas at the anode and additional NaOH at the cathode. The Cl_2 of Wanngard immediately dissolves into the solvent (water) to form HClO and HCl, whereas the Cl_2 of Oda was permitted to escape the cell in the gaseous state. Therefore, one of ordinary skill in the art would have had a reasonable expectation of successfully substituting the gas diffusion electrode of Oda et al into the cell of Wanngard.

Regarding claim 2, Oda et al teach (as above, figure 2) that the gas diffusion electrode divided the cathode compartment into a gas chamber (9) on one side of the gas diffusion electrode and an alkali metal hydroxide chamber (7) on the other side thereof. An alkali metal solution was introduced to the alkali metal hydroxide chamber at 12 and an oxygen containing gas was introduced to the gas chamber at 14.

Regarding claim 3, Oda et al teach (as above) using a cation selective membrane.

Regarding claims 5, 6 and 11, Wanngard teaches (see col. 6) using a pH of the solution of 5.5-6.5, a chloride concentration of 100-140 g/l, a chlorate concentration of 500-650 g/l and a temperature of 50-100°C.

Regarding claim 8, Wanngard teaches (see col. 7, lines 5-8) using a minor addition of sodium chromate. It would have been obvious to one of ordinary skill in the art to have optimized the amount of chromate used.

Regarding claim 10, Wanngard does not disclose a concentration of sodium hydroxide in the catholyte. However, it would have been obvious to one of ordinary skill in the art to have optimized the concentration of the hydroxide being produced in the electrolyzer in order to achieve proper reaction rate.

Regarding claim 12, Wanngard teaches feeding both the electrolyzed anolyte and the electrolyzed catholyte to the chlorate reactor (4).

Regarding claim 23, the cell of Oda et al included (see figure 2) a gas diffusion electrode (8) which divided the cathode compartment into a gas chamber (9) on one side of the gas diffusion electrode and an alkali metal hydroxide chamber (7) on the other side between the gas diffusion electrode and the cation selective separator. The process of Oda et al included (see Example 1) introducing a weak alkali metal hydroxide solution into the alkali metal hydroxide chamber and oxygen containing gas into the gas chamber. The cation selective separator was a membrane. Wanngard teaches (see cols. 3-4) using a pH of the solution of 5.0-7.5.

Regarding claim 26, see above regarding claims 1, 5, 6 and 10.

Response to Arguments

6. Applicant's arguments filed 6 May 2010 have been fully considered but they are not persuasive. Applicant has argued that:

a. Millet fails to teach a chlorate reactor.

In response, nothing in Applicant's claim further defines the structure of the chlorate reactor beyond its function "to react the electrolysed solution further to produce a concentrated alkali metal chlorate electrolyte". The crystallization reactor of Millet reacts the solution to produce a concentrated alkali metal chlorate prior to ultimate crystallization by evaporation of the water. Evaporation of water is a reaction of liquid water into gaseous water.

- b. Millet teaches away from the combination with Oda or Shimamune because Millet teaches that production of hydrogen gas ensure proper agitation of the catholyte and also the desire to not have a special electrode.

In response, there is more than sufficient advantage that is taught by Oda and Shimamune to substitute the gas diffusion electrode for the basic hydrogen evolving cathode of Millet. Both Oda and Shimamune teach reduction of the necessary voltage required for the cathode reaction by using the gas diffusion electrode fed with oxygen gas. The economic benefit of overall reduced electric energy consumption (described by Shimamune as being 700 kWh per ton of NaOH produced) for the electrolysis reaction would be able to offset any additional agitation or electrode costs. Further, the agitation of the electrolyte was known to one of ordinary skill in the art to be implemented by means other than hydrogen production at the cathode, or, as is taught by Shimamune, elimination of the gap between the gas diffusion cathode and the ion exchange membrane can result in not having to worry about any agitation of the catholyte. A zero-gap arrangement is within the scope of the present invention as indicated at the bottom of page 5 of the specification.

Further, Shimamune teaches (see col. 2, lines 41-56) that the gas diffusion cathodes are meant to replace hydrogen evolving cathodes (where the cathodic reaction was $2\text{H}_2\text{O} + 2\text{e}^- \rightarrow 4\text{OH}^- + \text{H}_2$ (-0.83V)) with electrodes that reacted water with oxygen gas (where the cathodic reaction was $2\text{H}_2\text{O} + \text{O}_2 + 4\text{e}^- \rightarrow 4\text{OH}^-$ (0.40V)). This means that theoretically the gas diffusion cathode would reduce cell voltage by as much as 1.23 V, with practical reductions of about 0.8 V, resulting in power savings of 700 kWh per ton of sodium hydroxide produced. Thus, one of ordinary skill in the art would have been motivated by the 700 kWh power savings to replace the hydrogen evolving cathode of Millet with the oxygen consuming gas diffusion electrode of either Oda or Shimamune.

- c. Cook does not teach transferring the electrolyzed solution to a chlorate reactor.

In response, nothing in Applicant's claim limits the structure or scope of the chlorate reactor beyond the function of increasing the concentration of the chlorate. Thus, the electrolyzer of Cook is deemed to fall within the claim scope as it functions to increase the concentration of chlorate in the electrolyte.

- d. It would not have been obvious to one of ordinary skill in the art to have substituted the gas diffusion electrode of Oda et al for the cathode of Cook, Jr.

In response, as set forth above, substitution of the gas diffusion cathode results in savings in terms of the electric energy required to drive the electrolytic reaction at the cathode, thereby providing a large incentive as the cost of electricity is a major portion of the total operating costs for any electrolytic reaction. Although Oda et al fail to teach

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any production of chlorate, substitution of the gas diffusion electrode would not have prevented the cell of Cook, Jr from continuing to function to produce chlorate.

e. Wanngard does not produce chlorate in a divided electrolytic cell.

In response, as noted in the rejection grounds above, it was known to one of ordinary skill in the art that any hydroxide ions crossing the membrane in a divided electrolytic cell would react with the hypochlorite ions (ClO^-) to cause formation of chlorate ions (ClO^-). Evidence of this knowledge can be seen in Cook, Jr. at col. 2, lines 5-26, which states that cation-active permselective membranes allow some hydroxyl ions to migrate through from catholyte to anolyte. The hydroxyl ions then react in the anolyte to produce chlorate. Thus, in the process of Wanngard, at least some chlorate ions were produced in the anode compartment of the divided electrolytic cell (12).

f. A skilled person would have no reason to modify the teaching of Wanngard in such a way that the instant process is arrived at since Wanngard is not aiming at providing a divided chlorate cell, particularly not a divided chlorate cell equipped with a gas diffusion electrode.

In response, as previously set forth by the examiner, and reiterated above, Wanngard, with evidence from Cook, Jr produces at least some chlorate ions in the divided electrolytic cell (12). Thus, although it may not have been the ultimate desire of Wanngard, none the less, the individual reaction steps occur within the process of Wanngard. Further, Oda provides significant motivation to replace a hydrogen evolving

cathode with a gas diffusion cathode fed with oxygen gas resulting in significant electrical energy savings at the cathode.

Conclusion

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

hdw

/Harry D Wilkins, III/
Primary Examiner, Art Unit 1795